

# Environmental and Social Due Diligence Report

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Project Number: 47083-004  
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## INDIA: Accelerating Infrastructure Investment Facility in India – Tranche 3 Mytrah Vayu (Pennar) Private Limited (Part 1 of 9)

Prepared by India Infrastructure Finance Company Limited for the India Infrastructure Finance Company Limited and the Asian Development Bank.

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## **Due Diligence Report on Environment and Social Safeguards**

**By**




**India Infrastructure Finance Company Limited (IIFCL)  
(A Govt. of India Enterprise)**

**Sub-Project: 63 MW Wind farm at Vajrakarur, Anantapur, Andhra Pradesh, India**



**July 2019**

**SUB PROJECT: 63 MW Wind farm at Vajrakarur, Anantapur, Andhra Pradesh, India****Mytrah Vayu (Pennar) Private Limited (MVPPL)****Environmental and Social Safeguards Due Diligence Report  
(ESDDR)**

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## **PROJECT BACKGROUND**

## **1. PURPOSE OF THE REPORT:**

1. This Environmental and Social Due Diligence Report (ESDDR) has been carried out by India Infrastructure Finance Company Limited (IIFCL) in consultation with the developer, Mytrah Vayu (Pennar) Private Limited (MVPPL) to assess the adequacy of the project with the applicable national safeguards and ADB's SPS (2009) compliance. The report has been prepared as per the documents/information received from the developer and on the basis of site visit observations. This ESDDR is updated version of the environment and social due diligence study submitted by Consultants in July 2016 (**Annexure I**). The status of implementation of the corrective measures identified in the ESDDR dated July 2016 to achieve compliance is given in the present ESDDR.

## **2. SUB-PROJECT:**

2. The sub-project includes operation and maintenance of 63 MW Wind Power project in the District Anantapur of Andhra Pradesh, India, commissioned during the year 2012.

## **3. SUB-PROJECT BACKGROUND:**

3. Mytrah Vayu (Pennar) Private Limited (hereinafter referred as MVPPL) a subsidiary company of M/s Mytrah Energy (India) Private Limited (MEIPL) has set up 63 MW (30 wind turbine generator x 2.1 MW) wind power project at Vajrakarur Mandal, Anantapur, Andhra Pradesh. Operation and maintenance of the project is executed through M/s Suzlon Energy limited. M/s MVPPL has signed power purchase agreement (PPA) with M/s Transmission Corporation of Andhra Pradesh limited (APTRANSCO), Government of Andhra Pradesh.

## **4. SUB-PROJECT LOCATION:**

4. The project site of 63 MW wind power project is spread at six Villages namely Chabala, Uravakonda, Chinnahatur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh. The nearest city Anantapur is about 45 km from the site. The nearest highway to the site is Bellary-Anantapur highway.

## **5. SUB-PROJECT TECHNICAL DETAILS:**

5. The total land procured for MVPPL is approximately 60.7 Hectares. State Government has allotted 15.22 ha of revenue land to the developer for 3 WTGs, balance 27 WTGs are located on private land. Sub-project description in brief is given in Table 1.

**Table 1: Project Description in Brief**

Sub-Project Developer	Mytrah Vayu (Pennar) Private Limited (MVPPL)
Project Site	Chabala, Uravakonda, Chinnahotur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh
Project Coordinates	Latitude : 14°58' N Longitude- 77°18' E
Project Capacity	63 MW
Number of WTGs	30
Capacity of each turbine	2.1 MW each
Model of wind turbine	Suzlon, S-88
Rotor Diameter	88 m
Hub Height	80 m
Total Cost of Project	Rs 402 crores
Commercial Operational Date	31 <sup>st</sup> March 2012 (First WTG commissioning date)
Sensitive area	The sub-project is not located in vicinity of any protected area or ecologically sensitive area
Type of land	60.7 Hectares (Revenue Land: 15.22 ha and Private Land: 45.48 ha)
Land use Type	Mix of agriculture and Open scrub barren land
Forest Land Involved	No Forest land involved
Power Evacuation	By Transmission Corporation of Andhra Pradesh limited (APTRANSCO), Government of Andhra Pradesh at 33/220 KV Vajrakarur substation in Anantapur district located at 22kms from the plant
PPA	PPAs were signed with APCPDCL for the entire capacity for 25 years from COD (March 31, 2012) at fixed tariff of Rs 4.38 per kwh (weighted average).

## 6. MAJOR COMPONENTS:

7. M/s MVPPL has used WTGs of Suzlon make (Model S-88) for the project. The WTG make S-88 has 88 m rotor diameter and hub height of 80 m. Each WTG has a rated capacity of 2.1 MW. This has tubular tower with three numbers of blades with a rotor swept area of 6082 sq m.
8. MVPPL and Andhra Pradesh Central Power Distribution Company Ltd. (APCPDCL) have signed a PPA. The power generated from MVPPL is being transmitted to 33/220 KV Vajrakarur substation in Anantapur district located approximately 22 kms from the plant.

## 7. O&M CONTRACT:

9. The O&M agreement between MVPPL and Suzlon Energy Limited (SEL) was signed on 21<sup>st</sup> December 2011. SEL is responsible for installation, operation and maintenance of the wind farm.
10. According to O&M contract Clause 5.6, SEL is responsible for all issues related to safety, health and environment requirements.

## 8. IIFCL FUNDING:

11. The total project cost of MVPPL is ₹ 402 crores. The project is financed by IIFCL under Takeout Finance Scheme. IIFCL has sanctioned and disbursed an amount of ₹ 120 crore towards MVPPL.

## 9. STATUS OF PROJECT IMPLEMENTATION:

12. The sub-project is under operation. The sub-project WTGs were commissioned during March – December 2012, as detailed in **Table 2**.

**Table 2: Commissioning Dates for WTGs at MVPPL**

No of WTGs	Capacity (MW)	Date of Commissioning
4	8.40	31st March 2012
4	8.40	18th June 2012
10	21.00	29th October 2012
10	21.00	30th October 2012
2	4.20	20th December 2012
<b>Total : 30</b>	<b>63 MW</b>	

## **DUE DILIGENCE ON ENVIRONMENTAL SAFEGUARDS**

## **10. ABOUT THE PROJECT**

13. Mytrah Vayu (Pennar) Private Limited (MVPPL) has set up a total of 63 MW wind power generation at Vajrakarur Mandal, Anantapur District in the state of Andhra Pradesh, India. MVPPL is the project company owned by MEIPL. There are total 30 WTGs having 2.1 MW capacity each.
14. The sub-project is located over 60.7 ha of land. Out of which Andhra Pradesh Government has allocated 15.22 ha of revenue land for 3 WTGs, rest 27 WTGs are located on private land.

## **11. APPROACH TO THE ENVIRONMENT SAFEGUARDS DUE DILIGENCE REPORT:**

15. The Environmental Due Diligence Report reviews the available documents/information and includes site visit observations. It also assesses the compliance of the sub-project with the respect to environmental safeguards, implementation of environmental management measures and institutional arrangement for implementing environmental measures. The baseline environment condition at the sub-project site was covered in the ESDDR dated July 2016, therefore not repeated in the present ESDDR. The ESDDR is an updation to the earlier ESDDR.
16. The following documents were referred in order to prepare Environmental Safeguards Due-Diligence Report:
  - ESDDR dated July 2016
  - Project Information Memorandum (PIM)
  - ESMS
  - Project Statutory Approvals/Permits
  - Project HSE documents
  - EMP implementation status documents
  - Labour License
  - Contract Documents
  - Grievance redressal mechanism
  - On-site Emergency Plan
  - Community Health and Safety Management Plan
17. The environmental safeguard due-diligence study was carried out for the sub-project on the basis of site visit observations and understanding project scope based on information and documents provided by Concessionaire. A detailed discussion on the environmental and social safeguards related issues was also carried out with the team of the sub-project at site.

## **12. COMPLIANCE OF MVPPL TO THE ESSF OF IIFCL:**

18. The Environmental and Social Safeguard Framework (ESSF) provides the enabling mechanism to IIFCL to deliver its policy objectives and applies to projects funded by IIFCL throughout the project

cycle. The ESSF defines procedures, roles, and responsibilities, at various project milestones for managing the adverse environmental impacts.

19. The environmental due diligence for MVPPL has been done as per requirements of take-out scheme. The environmental safeguard risks during operational phase have been assessed. In case of MVPPL, no significant outstanding legal or legacy issues are pending and no significant outstanding risks for either IIFCL or DFI involved and the environmental management plans (EMPs) are being implemented during the operational phase of sub-project.
20. The environmental safeguard due-diligence study has been carried out for the sub-project on the basis of site visit observations and based on information and documents provided by Concessionaire. A detailed discussion on the environmental and social safeguards related issues was also carried out with the team of the sub-project. It can be concluded that MVPPL is compliant to the requirements of IIFCL's ESSF under takeout scheme and has adequate EMP implementation on site.

### 13. POLICY, LEGAL AND REGULATORY REQUIREMENT:

21. Wind power projects are not listed in Schedule I of the EIA Notification, 2006 that lists projects or activities requiring prior environmental clearance and hence these are exempt from obtaining Environmental Clearance. As per the categorization of industries by the Central Pollution Control Board and its Office Memorandum to all State Pollution Control Boards, wind power generation comes under white category of industry.
22. MVPPL is required to comply with the applicable guidelines relating to the environment, occupational health and safety in addition to complying with local laws and regulations. The statutory clearances related to environmental aspects obtained from regulatory authorities as part of the MVPPL development were assessed and current status of availability of such clearances are given in **Table 2** below:

**Table 3: Status of Regulatory Clearances Obtained related to Environmental Safeguards**

S.No.	Clearances	Statutory Authority	Current Status of Clearance
1.	Environmental Clearance	Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi	Not applicable, as Wind Power project development is not listed in Schedule I of the MoEF&CC's EIA Notification 2006, that lists projects or activities requiring prior environmental clearance and hence this is exempted from obtaining the same.

2.	Forest Clearance	MoEF&CC and State Forest Department	Not applicable, as the sub-project does not involve any forest land.
3.	Wildlife Clearance	MoEF&CC	The Project area does not lie within an Ecologically Sensitive Area and is not located within 10 km of any National Park/Wildlife Sanctuary. The location of Project does not contravene any international biodiversity or ecosystem conservation conventions. Therefore, it does not require wildlife clearance or permission.
4.	Consent to Establish/Operate	Andhra Pradesh Pollution Control Board (APPCB), Andhra Pradesh State	<p>In the operation phase of MVPPL, consent from the APPCB is not required pursuant to Government Order on Andhra Pradesh Wind Power Policy, 2015 dated 13.2.2015 (<b>Annexure II</b>).</p> <p>With regard to the applicability of taking consent prior to 2015, the developer has provided substantial clarifications. Developer has informed that in general, Consents under Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control of Pollution) Act, 1974 are required for the industries which cause air and water pollution, whereas wind farm operations do not result in air and water pollution. However, in the initial stages of evolution of the wind energy sector, there was no uniform policy across different States in the matter of treatment of the sector from pollution perspective. This resulted in multiple views and practices in that regard and lead the wind developers to continuously represent to the MoEFCC, CPCB, SPCB for specifically exempting wind power projects from the requirement of obtaining any consent from the SPCBs for establishment or operation. Eventually MoEFCC declared Wind industry as Green Industry in line with MNRE and subsequently CPCB changed it to White category status vide circular dated 7.3.2016, which was circulated to all SPCBs.</p> <p>Thus there was neither a practice of obtaining Consent from SPCBs by the wind developers nor did the SPCBs insist such consents at that time. It</p>

			<p>is pertinent to note that all the wind power projects are setup pursuant to Power Purchase Agreements signed with State / Central Utilities.</p> <p>The third party ESDDR also mentions at page 41-42, Table 4-1 that “Moreover, as per “Wind Power Policy”, issued by the Government of Andhra Pradesh vide G.O.Ms.No.48 dated 11.04.2008 and G.O.Ms.No.99 dated 09.09.2008 Wind power projects are exempted from obtaining any NOC/Consent for establishment under pollution control laws from AP Pollution Control Board.</p>
5.	Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008	Andhra Pradesh Pollution Control Board (APPCB), Andhra Pradesh State	<p>Developer has informed that responsibility of hazardous waste disposal lies with O&amp;M contractor and all the formalities led down in the rules are followed. MVPPL as principal employer ensures the same. Sample copy of forms for disposal of hazardous waste to authorised vendors is given as <b>Annexure III</b>.</p> <p>The developer has shared Gazette Notification dated 1.03.2019, which clarifies that authorization under Hazardous Waste Rule is exempt in case Consent to Establish / Operate is exempted by State Pollution Control Board (<b>Annexure IV</b>).</p>
6.	Power Evacuation Approvals	Transmission Corporation of Andhra Pradesh Limited (APTRANSCO)	Power evacuation approval was given by Transmission Corporation of Andhra Pradesh Limited (APTRANSCO) vide letter dated 12.11.2010 ( <b>Annexure V</b> ).
7.	CEIG Approval	Electrical Inspector, Directorate of Electrical Safety, Government of Andhra Pradesh	Deputy Electrical Inspector, Directorate of Electrical Safety, Government of Andhra Pradesh approval for 2018-19 is attached as <b>Annexure VI</b> .

#### 14. IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLANS:

23. In the ESDDR (July 2016), the WTGs and associated facilities within 2 km buffer area were considered as study area for assessment of impact. Developer has informed that the ESDD Consultant has done a primary and also included certain information based on secondary data of the region.

24. There were certain gaps identified in the ESDDR (July 2016) and an ESMP was suggested for operational phase. The status of corrective actions suggested in gap assessment and ESMP implementation is given in **Table 4 and 5** on the basis of information received from the developer and site visit.
25. Specific issues as an updation to the ESDDR dated July 2016 are given in subsequent paras.
26. **Analysis of Bird & Bat Study:** The bird and bat study was conducted for two seasons - winter and monsoon (**Annexure VII**). Monitoring during the study included survey around 2 km radius of the project area, vantage point survey, water-body survey and carcass survey at operational WTGs to record issues of bird/bat collision. As per the study report a total of 56 bird species were recorded during the monitoring seasons (winter & monsoon). Out of 56 bird species, 4 species of birds were Winter Migrants and 52 species were local resident birds. Of these 56 species, 04 bird species are of conservation importance. All the 52 resident bird species recorded during the study period (winter & monsoon seasons) belongs to “Least Concern” category in accordance to IUCN Red list category. No bat species were sighted during the survey, however, as per discussions held with villagers residing within the study area, 1 bat species is reported to be present within the study area. No carcass of any livestock animals was sighted in the study area during the Winter & Monsoon Seasons survey. Consultant has confirmed that the study area does not form part of any critical habitat, IUCN protected area, Important Bird Area and Ramsar Wetland Site. In addition, no “Critically Endangered” or “Endangered” species were recorded during the primary survey. Poor rainfall and lack of suitable habitat and natural major water body within the 02 km periphery of the project study, limits the project area for being used as resting or staging point by migratory birds. The study concludes that the operation activities with respect to wind project will not be detrimental to the survival of these species. Attempts are to be made by developer not to bring in major changes in study area habitats which may attract birds and bats for foraging, nesting and resting purposes.
27. The EMP is being implemented at MVPPL site during the operation phase and is found to be adequate. The sub-project also has adequate institutional arrangement for implementation of EMP. The records are maintained by Suzlon O&M team and Mytrah EHS team. The status of EMP implementation during operation phase of MVPPL based on information shared by MVPPL and site visit is presented in **Table 5**. Environmental monitoring at the sub-project is being done annually for air, water and noise levels. EHS Audit is conducted annually at MVPPL as per procedures laid down in the ESMS.
28. During site visit it was informed by sub-project staffs that about 36,483 saplings were planted in and around project area in the last 5 years. The survival records of plantation are kept at site. Site staff also informed that the survival rate of last year plantation is about 60%.

**Table 4: Status of Implementation of E&S Gap Assessment**

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	<b>IFC PS1: Assessment and Management of Environmental and Social Risks and Impacts</b>	<b>ADB SPS Environmental Safeguards</b>				
1.1	<b>ESMS Policy:</b> The client Should establish and maintain an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project and commensurate with the level of social and environmental risks and impacts.	The client should establish an ESMS and implement corrective action planbased on safeguards compliance audit.	<p>MVPPL is committed to implement an effective ESMS based on dynamic process and through involvement of its vendor, client, employee, local communities and stakeholders. MVPPL has established an ESMS system based on Quality, Safety, Health and Environment (QHSE) policy of the company. Compliance of HSE activities of the company is guided by Corporate EHS head.</p> <p>Standard Operating Procedure (SOP) as per QHSE policy has been prepared and followed for coordinating site activities.</p> <p>HSE activities at site are controlled through Site In Charge.</p> <p>Site staffs are given Basic Safety Training as per the</p>		ESMS needs to be Reviewed periodically to address changes in the organization, process or regulatory requirements.	<p>ESMS is established and reviewed (<b>Annexure VIII</b>).</p> <p>Developer has informed that it will be updated in time in case of change in the organization and major regulatory requirements applicable to renewable industry.</p>

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
			<p>training records reviewed at site.</p> <p>The O &amp; M Contractor of the project SGSL also has a well- established HSE policy in line with OHSAS, 18001 and ISO 14000 standards.</p>			
1.2	<b>Environment and Social Impact Assessment:</b> The IFC performance standard requires detailed impact assessment of environmental and social sensitivities in the area and preparation of a management plan for construction and operation phase.	The wind power projects do not require Environmental clearance as per the EIA Notification dated 14 <sup>th</sup> September, 2006 and its subsequent amendments.		Environmental and Social Impact assessment (ESIA) study has not been undertaken for this project.	Environment Management Plan (EMP) should be implemented based on ESDD study.	Environmental and Social Management Plan (ESMP) developed based on ESDD study is being implemented. Status of ESMP is given in <b>Table 5</b> .
1.3	<b>Identification of environmental and social risks:</b> MVPPL should establish and maintain a process for identifying the environmental and social risks and impacts of the project. The type, scale, and location of the project guide the scope and level of effort devoted to the risks and impacts identification process.		<p>SGSL has identified and maintains records of health and safety risks associated with the routine activities and accordingly PPE has been identified. SOP has been developed for safety risks of regular O &amp; M activities. MEIL has not identified the environmental and social risks associated with the project. ESIA study has been carried out for Phase-II of the project.</p>	Before commencement of proposed project Environmental and Social Screening has not been carried out.	Findings of the Phase-II ESIA study as well as present ESDD study to be considered for identification of environmental and social risks associated with the operation of the project.	ESDD study was duly considered in identification of environmental and social risks during operation phase.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
1.4	<b>Legal Compliance:</b> The project should comply with the applicable laws and regulations of the jurisdictions in which it is being undertaken, including those laws implementing host country obligations under international law.	The project should comply with host country's social and environmental laws and regulations, including those laws implementing host country obligations under international law.	Wind power projects leads to generate hazardous waste such as used transformer oil, gear box oil and oil soaked cotton waste. Hazardous waste is not been stored securely. Storage area was in open, not weather protected and the siting ground was not been paved to prevent ground water pollution.  Hazardous waste is disposed of to TSDF facility through authorized vendor.	The project should obtain Form 12 under Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008.  The project has not obtained authorization from APPCB for storage of Hazardous waste.	The guideline of APPCB should be complied with respect to hazardous waste storage and transport.  E-waste to be managed as per APPCB guidelines.  Waste Batteries to be disposed of through authorized vendor.	Vajrakarur project is a turnkey project, where OEM is responsible for hazardous waste management. As a principal employer, MVPPL is ensuring the safe disposal of hazardous waste under the Hazardous and other Waste Management Rules, 2016 ( <b>Annexure III</b> ).  Further, OEM is responsible for E- waste management. However, insignificant E-waste (laptop, battery) being generated by MVPPL is stored separately and sent to the head office for further disposal through authorized vendors.  Waste batteries being generated are disposed of by O&M contractor as per the Batteries Waste Management Rules, 2001.
1.5	<b>Management Programme:</b> Management programme with defined desired outcomes as measurable events to mitigate and implement improvement measures and actions that address identified social and	Prepare an Environmental Management Plan, Resettlement Plan, and / or Indigenous Peoples Plan to address identified environmental and social risks and	MVPPL is committed to implement an effective ESMS based on dynamic process and through involvement of its vendor, client, employee, local communities and stakeholders. MVPPL has	Environmental and Social Impact Assessment (ESIA) study has not been undertaken for this project.	Project specific environmental and social management plan should be developed on the basis of findings of ESDD and Phase-II ESIA study.	Environmental and Social Management Plan (ESMP) was proposed to mitigate the environmental and social risks and impacts.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	environmental risks and impacts.	impacts.	established an ESMS system based on Quality, Safety, Health and Environment (QHSE) policy of the company.			
1.6	<b>Organization Structure:</b> The Client should establish, maintain and strengthen as necessary, an organizational structure that defines roles, responsibilities, and authority to implement the ESMS.		MVPPL as a whole has a well-established team to coordinate the site activities.  The organization structure as well as their responsibility was displayed at notice board.	The internal reporting mechanism between MVPPL and subcontractors is informal.	Project specific organization structure shall be included under corporate communication, policy implementation team and other environment and sustainable related report.	Organization structure for implementation of environment and social management system is enclosed as <b>Annexure IX</b> .
1.7	<b>Training:</b> Trainings to employees and contractors with direct responsibilities for activities related to the project's social and environmental performance.	This requirement is subsumed within the ESMS or EMP	Training calendar has specific training schedule for EHS. Training participation record is maintained.	Need based training should be organized for MVPPL employee, which should be an integral part of HR policy.	Training/workshops should be undertaken for the project and corporate staffs as per their training requirements at regular intervals.	Corporate as well as site employees are provided with periodic training as per their requirements.
1.8	<b>Emergency Preparedness Plan:</b> The client should establish and maintain an emergency preparedness and response system so that the MVPPL shall be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and /or the environment.		Emergency contact numbers, specific team member responsibility and key elements of emergency plan were observed to be displayed in the site office.	The onsite emergency response plan and emergency contact numbers were not displayed in local languages.	Annual monitoring and evaluation report should be submitted.	On site Emergency plan is available which depicts the emergency team members and emergency contact numbers.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
1.9	<b>Monitoring and Review:</b> The Client should establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and / or contractual obligations and regulatory requirements participate in monitoring activities.	Implement the EMP and Monitor its effectiveness, documentation of monitoring results, including the development implementation of corrective actions, and disclose monitoring reports.	Project site related EHS activities are regulated by corporate office. Documents pertaining to incident reporting, work permits and SOP were verified at site.	Compliance submission of the project to ensure the implementation of proper management, documentation, and implementation of corrective actions required.	Internal/third party audits need to be undertaken periodically.	Internal audits such as ESMS audit, EHS audit, and OMS audit are being carried out on annual basis. Developer has further informed that, as an ISO certified company, third party ISO audit is also planned once in three years for this project.
1.10	<b>Stake Holder Engagement:</b> the client should engage Stake holder engagements for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts.	Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance	Focus Group Discussion, Community Consultation, Household survey, & other stakeholder meetings have been carried out. A fruitful result of consultation was observed as the outcomes of primary survey. Different CSR activities are executed at project level.	MVPPL do not have a formal stakeholder engagement plan to address community needs.	A stakeholder engagement plan needs to be formulated to address the community needs through self or through turnkey contractor.	Developer has informed that a Stakeholder Engagement Plan is framed as per ESMS in order to engage various stakeholders and address the community issues.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		redressal mechanism to receive and facilitate resolution of the affected people’s concerns and grievances regarding the project’s environmental performance.				
1.11	<b>External Communications and Grievance Mechanisms:</b> The client should implement and maintain procedure for external communications that includes methods to: (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them. In addition, MVPPL should encourage making publicly available periodic reports on their environmental and social sustainability.	Disclose a draft Environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	A register was been found to be maintained at site to record grievances. A transport process of grievance redressal mechanism is followed for the regular employees.	No formal grievance redressal mechanism is followed. Register of grievance record do not have any documentation of further action plan to be executed to address the grievances.	Formulate a formal grievance redress mechanism/system for addressing grievance through self-developed process or through turnkey contractor and the grievance redressal should be linked to grievance record register.	Grievance Redressal Mechanism is in place to register any complaints regarding community issues. Grievance register is maintained at site. GRM is enclosed as <b>Annexure X</b> .
2	<b>PS 2: Labour and Working Conditions</b>	<b>ADB Environmental Safeguards</b>				
2.1	<b>Human Resources (HR) Policies and Procedures:</b> The client should adopt and implement human resource policies appropriate to its size and workforce that sets out an approach to managing workers consistent with the requirements of this performance standard and the national law.		Both MEIL and SGSL have an established HR Policy. The hiring of human resource is as per the HR policies and their guidelines.	Internal audits are not undertaken to assess the implementation of contact conditions between MVPPL and its subcontractors.	Internal audits need to be undertaken to maintain adherence to the HR policies at site office of the applicable stake holder.	Internal audits are carried out annually to assess the implementation of policies at corporate as well as site.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
2.2	<b>Working Conditions and Terms of Employment:</b> The client should provide Workers with documented information that is clear and understandable, regarding their rights under national labour and employment law and any applicable agreements		Terms of employment, employee rights and benefits entitled are clearly spelled out in appointment letter. Safe drinking water, sanitary conveniences, canteen facilities, rest room has been provided for the project site workers.	There is no formal procedure to educate about employee rights. Workers are not aware of their rights and compensation.	Workers should be educated about their rights and compensation. MVPPL should ensure that workers of different turnkey contractors are aware of national labour and employment law and any other applicable agreements.	Employees are explained clearly regarding terms of employment, employee rights and other benefits during induction program. Records are kept for the same.
2.3	<b>Workers' Organization:</b> Where law recognizes workers right to form and join workers organizations of their choice	Right to Organize and Collective Bargaining Convention, 1949 (No.98). This Convention provides or protection against anti-union discrimination, for protection of workers and employers organizations against acts of interference by each other, and for measures to promote and encourage collective bargaining.	It was observed that there were no policies by MVPPL or SGSL restricting formation of a union or collective bargaining.		Provide for an appropriate forum for the employees for collective bargaining.	Developer has informed that MVPPL respects the worker rights and has not restricted on formation of labour union.
2.4	<b>Migrant Workers:</b> The client should identify Migrant workers and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work.	In order to strengthen non-Discrimination in a project, ADB requires that migrant workers should be protected on an equal basis by national legislates on and that they have the same human rights as national workers.	No discrimination was observed or reported by any workers at site.		Prior to assigning any contract, MVPPL should pre-qualify each contractor according to its performance on EHS standards so as to satisfy MVPPL's ESMS standards.	Developer has informed that MVPPL ascertains that their contractor's performance is in accordance with the EHS standards.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
2.5	<b>Non Discrimination and Equal Opportunity:</b> The client should not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. MVPPL should base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate	The key anti-discrimination suggestions for ethnic discrimination identified by ADB as part of their Core Labour Standards (CLS) hand book applicable are: Complaints committee for resolution of complaints of discrimination, harassment, or other working condition concerns. Challenging stereotypes of minorities to ensure equal opportunity and treatment. Occupational health and safety for all including minorities, Health insurance and social security for all Encouraging minority groups/organizations to form and join groups / organizations representing their interests. Protecting migrant workers especially if they are members of ethnic minorities.	Based on requirement and relevant educational qualification with experience, the opportunity of different job is getting closed.		Prior to assigning any contract, MVPPL should pre-qualify each contractor according to its performance on EHS standards so as to satisfy MVPPL's ESMS standards.	Developer has informed that MVPPL ascertains that their contractor's performance is in accordance with the EHS standards.
2.6	<b>Grievance Mechanism:</b> Grievance mechanism for workers where they can raise reasonable workplace concerns	There should be a mechanism within projects for the resolution of complaints of discrimination,	MVPPL and SEL have a system to address the workplace concerns and grievances of its employees.	MVPPL has prepared a framework to address all the issues related to grievance	Awareness should be built among the employees about their rights and compensation.	Employees are informed about their rights, compensation and how to address the issues through grievance redressal

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		harassment, or other working condition concerns.		mechanism.		mechanism.
2.7	<b>Child Labour:</b> The client will not employ children in any manner	The ILO Minimum Age Convention, 1973 (No. 138) and its accompanying Recommendation (No. 146) set the goal of elimination of child labour, and the basic minimum age for employment or work (in developing countries at 14 years of age or the end of compulsory schooling, whichever is higher; and 15 or the end of compulsory schooling for developed countries). The Convention sets a minimum age of 2 years younger for “light work” i.e., 12 and 13 years, respectively; and a higher minimum age for dangerous or hazardous work (basically 18 years of age, but 16 in certain circumstances).	No child labor was observed at site during the site visit.		Prior to assigning any contract, MVPPL should pre-qualify each contractor according to its performance on EHS standards so as to satisfy MVPPL’s ESMS standards.	According to Mytrah’s policy, the contractor should not engage any kind of child labour as well as forced labour. Mytrah has an Integrated HR policy in place, which is applicable to all its projects.
2.8	<b>Forced Labour:</b> MVPPL will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.	Elimination of all forms of forced or compulsory labour. According to the Forced Labour Convention, 1930 (No.29), the ILO defines forced labour for the purposes of international	No forced labour was observed at site during the site visit.		Prior to assigning any contract, MVPPL should pre-qualify each contractor according to its performance on EHS standards so as to satisfy MPKPL’s	According to Mytrah’s policy, the contractor should not engage any kind of forced labour as well as forced labour. Mytrah has an Integrated HR policy in place, which is applicable to all its projects.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		law as “all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily”. The other fundamental ILO instrument, the Abolition of Forced Labour Convention, 1957 (No. 105), specifies that forced labour can never be used for the purpose of economic development or as a means of political education, discrimination, labour discipline, or punishment for having participated in strikes.			ESMS standards.	
2.9	<b>Occupational Health and Safety:</b> The client will provide a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in MVPPL’s work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women.	Special care needs to be taken in projects to ensure the health and safety of all workers, including members of minorities. In many cases, minority workers are unable to read safety instructions or to understand safety and health training given to other workers. Provide workers with safe and healthy working conditions including easily comprehensible safety. Information on-site training, provisions of	Hazard identification and risk assessment manual has identified and recorded the health and safety risks associated with O & M operations. Measures to deal with emergency condition have been displayed at project site. First aid box with necessary kits were observed to be put on at an easy accessible place. PPEs have been provided to the workers. It was informed that work permits are issued before	Non usage of PPEs shows a behavior based issue in this aspect.	An annual EHS assessment/audit needs to be undertaken. Usage of PPEs should be enforced through penalties for not using PPEs or incentive for adhering to the criteria.	EHS audit is being carried out annually. Sample copy EHS audit checklist is attached as <b>Annexure XI</b> . Personnel Protective Equipment and safety items are mandatory for working at site.

S.No.	Performance Standards	Observation	Gaps	Recommendation	Status
		Personal Protective Equipment etc.  going for maintenance works. Maintenance work is supervised by dedicated engineer for the same. In case of medical emergencies employees are taken to nearest hospital in Uravakonda town.			
3.	<b>PS 3: Resource Efficiency and Pollution Prevention</b>	<b>ADB Environmental Safeguards</b>			
3.1	<b>Resource Efficiency:</b> The client will implement the project's location, technically and financially feasible and cost effective measures for improving efficiency in its consumption of energy, water as well as other resources and material inputs. During the design, construction, operations and decommissioning of the project (project lifecycle), the client is to consider ambient conditions and apply pollution prevention and control technologies and techniques.	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Resource efficiency measures have been incorporated in the design stage of the project itself.	Awareness should be built among the employees about importance of conservation of natural resources.	Developer has informed that awareness campaigns are conducted on various occasions such as World Environment Day, National Safety week, World Water Day, World earth day etc regarding the significance of the natural resources and their conservation.
3.2	<b>Water Consumption:</b> when the project is potentially significant consumer of water, the client shall adopt measures to reduce water consumption of the project.		The project is not a significant consumer of water. Domestic water requirement is the only water demand for the project. Potable water requirement is fulfilled through	Awareness should be built among the employees about importance of conservation of natural resources.	Developer has informed that awareness campaigns are conducted on various occasions such as World Environment Day, National Safety week, World Water Day, World earth day etc regarding the significance of the natural resources and

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
			packaged drinking water supply. As reported non potable domestic water requirement is fulfilled though tanker water supply.			their conservation.
3.3	<b>Wastes and Hazardous Materials Management:</b> To avoid and minimize generation of hazardous and non-hazardous waste materials as far as practicable. Where waste generation cannot be avoided, but has been minimized, the client will recover and reuse wastes, where wastes cannot be recovered or reused; the client should treat, destroy and dispose of in an environmentally sound manner. If the generated waste is considered hazardous, the client will explore commercially reasonable alternatives for its environmentally sound disposal, considering the limitations applicable to its trans-boundary movement.	MVPPL should avoid, or where avoidance is not possible, should minimize or control the generation of hazardous and non-hazardous wastes and the release of hazardous materials resulting from project activities. Where waste cannot be recovered or reused, it will be treated, destroyed, and disposed-off in an environmentally sound manner. If the generated hazardous, MVPPL should explore reasonable alternatives for its environmentally sound disposal considering the Limitations applicable to its Trans boundary movement. When waste disposal is conducted by third parties, MVPPL should use contractors that are Reputable and legitimate enterprises licensed by the relevant regulatory agencies.	Wind power projects leads to generate hazardous waste such as used transformer oil, gear box oil and oil soaked cotton waste. Hazardous waste is not been stored securely. Storage area was in open, not weather protected and the siting ground was not been paved to prevent ground water pollution.  Hazardous waste is disposed off to TSDF facility through authorized vendor.  E-waste was stored in open only.  Garbage and recyclable waste to be collected separately.	There is no proper provision for storage of hazardous waste at the project site.	The guideline of APPCB should be complied with respect to hazardous waste storage and transport.  E-waste to be disposed off through authorized E-waste processor only.  Garbage and recyclable waste to be collected separately.  Recyclable waste to be sold to authorized vendor.	Vajrakarur project is a turnkey project, where OEM is responsible for hazardous waste management. As a principal employer, MVPPL is ensuring the safe disposal of hazardous waste under the Hazardous and other Waste Management Rules, 2016. Further, OEM is responsible for E-waste management. However, insignificant E-waste (laptop, battery) being generated by MVPPL is stored separately and sent to the head office for further disposal through authorized vendors. Garbage and recyclable waste are collected separately. Recyclable waste is disposed through SPCB authorized vendors. Garbage is properly disposed as per SWM rules, 2016.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
3.4	<b>Greenhouse Gases:</b> MVPPL should consider alternatives and implement technically and financially feasible and cost effective options to reduce project- related GHG emissions during the design and operation of the project. These options may include, but are not limited to, alternative project locations, adoption of renewable or low carbon energy sources.	MVPPL should promote the reduction of project-related anthropogenic greenhouse gas emissions in a manner appropriate to the nature and scale of project operations and impacts. during the development or operation of projects that are expected to or currently produce significant quantities of greenhouse gases, the MVPPL should quantify direct emissions from the facilities within the physical project boundary and indirect emissions associated with the off-site production of power used by the project. MVPPL should conduct quantification and monitoring of greenhouse gas emissions annually in accordance with internationally recognized methodologies. In addition, MVPPL will evaluate technically and financially feasible and cost-effective options to reduce or offset project-related greenhouse gas emissions during project design and operation, and pursue appropriate	Project is a renewable energy project and do not produce the GHG emissions		Awareness to be developed among employees regarding effects of greenhouse gas emissions.	Awareness programs are conducted as a part of World Environment Day to describe the impacts of greenhouse gas emissions

S.No.	Performance Standards	Observation	Gaps	Recommendation	Status
		options.			
3.5	<p><b>Release of pollutants:</b> MVPPL should avoid the release of pollutants to air, water and land due to routine, non-routine, and accidental circumstances with the potential for local, regional, and trans boundary impacts or, minimize and/or control the intensity and mass flow of their release. To address potential adverse project impacts on existing ambient conditions, MVPPL should consider relevant factors, including, for example existing ambient conditions, etc.</p>	<p>Avoid, and where avoidance is not possible, minimize, mitigate, and / or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.</p>	<p>Wind power projects leads to generate hazardous waste such as used transformer oil, gear box oil and oil soaked cotton waste. Hazardous waste is not been stored securely. Storage area was in open, not weather protected and the siting ground was not been paved to prevent ground water pollution. Hazardous waste is disposed of to TSDF facility through authorized vendor.</p>	<p>There is no proper provision for storage of hazardous waste at the project site. Approach road to the site should be hardscape area. Car Parking area is not having concrete built up area.</p>	<p>The guideline of APPCB should be complied with respect to hazardous waste storage and transport. Approach road to the site to be maintained properly.</p> <p>Hazardous waste disposal lies with O&amp;M contractor. As a principal employer MVPPL ensures that the waste is disposed as per Hazardous and other Waste Management Rules, 2016.</p> <p>Suitable storage yard for storing segregated hazardous and solid waste is ensured. The storage space is an impervious paved surface and has a secondary containment area and spill control toolkit. Waste is being disposed of through approved vendors in accordance with standard norms.</p> <p>During site visit it was confirmed that hazardous waste is stored in contained area with impervious surface and the approach road to the site is maintained properly.</p>
3.6	<p><b>Pesticide Use and Management:</b> Formulate and implement an integrated pest management (IPM) and or integrated vector management (IVM) approach to pest</p>	<p>The environmental assessment will ascertain that any pest and/or vector management activities related to the project are based on</p>	<p>Though a few plantations were seen around the grid substation, staff of MVPPL informed that no pesticides or insecticides are used.</p>	<p>Awareness should be built among employees about health and environmental risks associated with</p>	<p>No pesticides or insecticides are used for the plantation in and around the project area.</p>

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	management	integrated pest management approaches and aim to reduce reliance on synthetic chemical pesticides in agricultural and public health projects. MVPPL's integrated pest / vector management program should entail coordinated use of pest and environmental information along with available pest / vector control methods, including cultural practices, biological, genetic and, as a last resort, chemical means to prevent unacceptable levels of pest damage. The health & environmental risks associated with pest management should be minimized with support, as needed, to institutional capacity development, to help regulate and monitor the distribution and use of pesticides and enhance the application of integrated pest management.			synthetic chemical pesticide.	
4	<b>IFCPS4: Community Health &amp; Safety &amp; Security:</b>					

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
4.1	<p><b>Community Health and Safety:</b> MVPPL should evaluate risks and impacts to the health and safety of the affected Communities during the project life-cycle and will establish preventive and control measures. MVPPL should avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups.</p>	<p>MVPPL should identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation and decommissioning of the project, and should establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts. These measures should favour the prevention or avoidance of risks and impacts over their minimization and reduction. Consideration should be given to potential exposure to both accidental and natural hazards, especially where the structural elements of the project are accessible to members of the affected community or where their failure could result in injury to the community. MVPPL should avoid or minimize the exacerbation of impacts caused by natural hazards, such as landslides or floods that could result from land use changes due to project</p>	<p>The project includes risks due to electrical hazards, and continuous exposure to turbine noise. The project site is situated within agricultural field and is at a considerable distance from the village settlements. However, communities working at the neighboring fields are vulnerable to H &amp; S risks.</p>	<p>Environmental and Social Impact assessment (ESIA) study has not been undertaken for this project.</p>	<p>Environment Management Plan should address anticipated impact and risk associated with this particular project and their processes.</p>	<p>Environmental and Social Management Plan (ESMP) was proposed to mitigate the environmental and social risks and impacts. ESMP is being implemented at the sub-project and status is given in <b>Table 5</b>.</p>

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		activities.				
4.2	<b>Hazardous Materials Management and Safety:</b> MVPPL should avoid or minimize the potential for community exposure to hazardous materials and substances that may be released by the project.	Avoid the use of hazardous materials subject to international bans or phase outs.	Wind power projects leads to generate hazardous waste such as used transformer oil, gear box oil and oil soaked cotton waste. Hazardous waste is not been stored securely. Storage area was in open, not weather protected and the siting ground was not been paved to prevent ground water pollution. Hazardous waste is disposed of to TSDF facility through authorized vendor.	There is no proper provision for storage of hazardous waste at the project site.	The guideline of APPCB should be complied with respect to hazardous waste storage and transport.	Vajrakarur project is a turnkey project, where OEM is responsible for hazardous waste management. As a principal employer, MVPPL is ensuring the safe disposal of hazardous waste under the Hazardous and other waste management Rules, 2016.
4.3	<b>Emergency Preparedness and Response:</b> MVPPL should document its emergency preparedness and response activities, resources, and responsibilities, and should disclose appropriate information to Affected Communities, relevant government agencies or other relevant parties.	Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Emergency contact numbers, specific team member responsibility and key elements of emergency plan were observed to be displayed in the site office.	The onsite emergency response plan and emergency contact numbers were not displayed in local languages.	Annual monitoring and evaluation report should be submitted.	On site Emergency plan is available which depicts the emergency team member, emergency contact numbers
4.4	<b>Security Personnel:</b> Where the client retains direct or contracted workers to provide security to safeguard its personnel and property, it will assess risks posed by its security arrangements to those within and outside the project		It was informed that the local persons are given opportunity to be engaged as security to safeguard the material on site.		Prior to assigning any contract, MVPPL should pre-qualify each security personnel so as to satisfy MVPPL’s ESMS standards.	MVPPL through contractor prequalifies each security personnel before assigning the contract.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	site. The client will make reasonable enquiries to ensure that those providing securities are not implicated in past abuses; will train them adequately in the use of force.					
<b>5</b>	<b>IFC PS5: Land Acquisition and Involuntary Resettlement</b>	<b>Involuntary Resettlement Safeguards</b>				
<b>5.1</b>	<b>Project design:</b> The project will consider feasible alternative project designs to avoid or at least minimize physical or economic displacement, while balancing environmental, social, and financial costs and benefits, paying particular attention to impacts on the poor and vulnerable.	Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks.	Out of 30 WTGs, 27 are situated in private agricultural land. Although the project involves an economic displacement, the project does not involve any re-settlement and rehabilitation of local population.			The project site is identified in such a way that it does not involve any resettlement activities.
<b>5.2</b>	<b>Compensation and Benefits for Displaced Persons:</b> MVPPL should provide unavoidable displaced PAPs with compensation for loss of assets at full replacement cost to help them restore their standards of living or livelihoods; Where livelihood is land-based or collectively owned, MVPPL should offer land-based compensation where feasible; MVPPL should provide opportunities to PAPs to derive	Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation	The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures. It was informed that the private agricultural lands used in the project have been purchased on willing seller-willing buyer basis directly from the land owners with the help of local land facilitator. The sellers have no complaint against the			Land was purchased on willing buyer willing seller basis and hence project does not involve any resettlement activities.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	appropriate development benefits from the project.		compensation paid.			
5.3	<b>Community Engagement:</b> Facilitate informed participation of all PAFs in decision and entitlement making resettlement processes. Consultation to continue through the implementation, monitoring and evaluation of payment and resettlement.	Carry out meaningful consultations with affected persons, host communities, and concerned nongovernment organizations. Inform all displaced persons of their entitlements and resettlement options. Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to affected persons and other stakeholders. The resettlement should elaborate upon displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule. Improve or at least restore, the livelihoods of all displaced persons	The primary survey, consultation and review of other relevant document have been carried out. No major social issue has been envisaged for this project.  The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures. The lands for the project have been purchased on willing seller-willing buyer basis directly from the land owners with the help of local land facilitator.  The sellers have no complaint against the compensation paid.	MVPPL do not have a formal stakeholder engagement plan to address community needs.	Stakeholder engagement plan needs to be formulated to address the community needs through turnkey contractor.	Stakeholder Engagement Plan is framed as per ESMS in order to engage various stakeholders and address the community issues.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of non-land assets.				
5.4	<b>Grievance Redressal Mechanism:</b> MVPPL to establish grievance redressal mechanism consistent with PS 1 to address concerns raised by PAPs	Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns.	A register was been found to be maintained at site to record grievances.	No formal grievance redressal mechanism is followed. Register of grievance record do not have any documentation of further action plan to be executed to address the grievances.	Maintain Record of action plan and completed actions with supporting documents.	Grievance Redressal mechanism is followed to address any community related issues. Grievance register comprises of action taken and status with supporting documents.
5.5	<b>Resettlement and Livelihood Restoration Planning and Implementation:</b> where involuntary resettlement is unavoidable either as a result of a negotiated settlement or expropriation, a census will be carried out to collect appropriate socio-economic baseline data to identify the actual eligible persons for compensation.		The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures.		In case of resettlement, census should be carried out to collect appropriate socio-economic baseline data of actual eligible persons and records of compensation to be maintained.	The project is devoid of any resettlement activities.
5.6	<b>Displacement:</b> <b>Physical Displacement:</b> The Client shall develop resettlement action plan of physical displacement. The plan will be designed to mitigate the negative impacts of displacement.		The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures. The lands for the project have been purchased on		In case of resettlement baseline data of actual eligible persons for compensation to be maintained.	The project is devoid of any resettlement activities.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	<b>Economic Displacement:</b> In case of projects involving economic displacement only, the client will develop a livelihood restoration plan to compensate affected persons and or communities and offer other assistance that meet the objective.		willing seller-willing buyer basis directly from the land owners with the help of local land facilitator. The sellers have no complaint against the compensation paid.			
<b>6</b>	<b>PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</b>					
<b>6.1</b>	<b>Impacts on Biodiversity:</b> Assess significance of project impacts on all levels of biodiversity as an integral part of social and environmental assessment process.	MVPPL should assess the significance of project impacts and risks on biodiversity and natural resources as an integral part of the environmental assessment process. The assessment will focus on the major threats to biodiversity, which include destruction of habitat and introduction of invasive alien species, and on the use of natural resources in an unsustainable manner.	The proposed site is on an agricultural land. The major ecological impact associated with the project is the risk of bird collision which is common with Wind power projects.  There is no report of the project area supporting any “Endangered” category of flora or fauna. The project area and its surroundings do not fall under any major flyway or migratory routes.	No formal procedure to record impact on avifauna has been formulated.	It is suggested to undertake a periodic bird/bat carcass survey in the project by site personal in the core study area. Standard operating procedure should also highlight emergency measures to be undertaken in case of bird and bat hitting to WTG or electrocution.	Long term bird and bat study was conducted for two seasons- Winter and Monsoon. It was evident from the survey that, the project area is devoid of any major fly way or migratory routes. The Bird and Bat study is enclosed as <b>Annexure VII</b> . The analysis is given in para 26 of the ESDDR.
<b>6.2</b>	<b>Legally Protected Areas:</b> If located within legally protected areas, to act in a manner consistent with the protected area management plan, consult stakeholder, implement additional	As above	There is no area of significance from conservation point of view within 10 km radius of the project.		Legally protected areas to be conserved, if any.	No legally protected areas are observed with in the project area.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
	programme to promote and enhance conservation aims.					
6.3	<b>Maintenance of Natural habitat:</b> The proponent should not significantly convert or degrade natural habitats, unless (i) no other viable alternatives within the region exist for development of the project on modified habitat; (ii) consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and, (iii) any conversion or degradation is mitigated.	As above	The proposed site is an agricultural land. ESIA has been conducted for Phase-II of the project; project site is almost contiguous with Phase I project site. The activities related to project are not expected to change natural habitat around the project area except anticipated impact to bat and avifauna population.	Environmental and Social Impact assessment (ESIA) study has not been undertaken for this project.	Natural habitat condition should be maintained in and around the project site.	Natural habitat condition and vegetation beyond WTG footprint is not disturbed.
7	<b>IFC PS7: Indigenous Peoples (Scheduled Tribes in Indian Context)</b>	<b>Indigenous People (Scheduled tribe)'s Safeguards</b>				
7.1	<b>Assessment of Impact:</b> Assessment needs to be done for identification of indigenous groups (Scheduled tribes) and the expected social, cultural and environmental impacts on them.	Screen early on to determine (i) whether Indigenous Peoples (Scheduled tribes) are present in, or have collective attachment to, the project area; and (ii) whether project impacts on Indigenous Peoples (Scheduled Tribes) are likely.	No indigenous people are reported from the project area.		Rights of indigenous people should be protected, if any.	No indigenous people are reported from the project area.
7.2	<b>Avoidance of Adverse Impacts:</b> The impacts on Affected Communities of Indigenous Peoples (Scheduled Tribes) should be avoided	Undertake a culturally appropriate and gender-sensitive social impact assessment or use similar methods to assess	The project did not impact any indigenous population.		Rights of indigenous people should be protected, if any.	No indigenous people are reported from the project area.

S.No.	Performance Standards	Observation	Gaps	Recommendation	Status
	where possible. Where alternatives have been explored and adverse impacts are unavoidable, MVPPL should minimize, restore, and / or compensate for these impacts, proposed actions will be developed with the Informed consultations and Participation of the Affected Communities of Indigenous Peoples and contained in a time-bound plan, such as an Indigenous Peoples Plan.	potential project impacts, both positive and adverse, on Indigenous Peoples. Give full consideration to options the affected Indigenous Peoples prefer in relation to the provision of project benefits and the design of mitigation measures.			
7.3	<b>Participation and Consent:</b> MVPPL should undertake an engagement process with the Affected Communities of Indigenous Peoples as required in Performance Standard 1. Ensure that the grievance mechanism established for the project, as described in PS1, is culturally appropriate and accessible.	Identify social and economic benefits for affected Indigenous Peoples that are culturally appropriate and gender and inter generationally inclusive and develop measures to avoid, minimize, and / or mitigate adverse impacts on Indigenous Peoples. Undertake meaningful consultations with affected Indigenous Peoples communities and concerned Indigenous Peoples organizations to solicit their participation (i) in designing, implementing, and monitoring measures to avoid adverse impacts or, when avoidance is not possible, to minimize,	The project did not impact any indigenous population.	Rights of indigenous people should be protected, if any.	The project did not impact any indigenous people.

S.No.	Performance Standards		Observation	Gaps	Recommendation	Status
		mitigate, or compensate for such effects; and (ii) in tailoring project benefits for affected Indigenous Peoples communities in a culturally appropriate manner.				
<b>8</b>	<b>IFC PS8: Cultural Heritage</b>					
<b>8.1</b>	<b>Protection of Cultural Heritage:</b> MVPPL should identify and protect cultural heritage by ensuring that internationally recognized practices for the protection, field-based study, and documentation of cultural heritage are implemented.	MVPPL is responsible for siting and designing the project to avoid significant damage to physical cultural resources. Such resources likely to be affected by the project will be identified, and qualified and experienced experts will assess the project's potential impacts on these resources using field-based survey as an integral part of the environmental assessment process.	No cultural heritage has been observed within the 10km study area.		Local cultural heritage should be protected, if any.	No cultural heritage has been observed within the 10 km study area.
<b>8.2</b>	<b>Community Access:</b> Where the client's project site contains cultural heritage or prevents access to previously accessible cultural heritage sites being used by, or that have been used by the affected communities within living memory for long standing cultural purposes, the client		A religious structure of local importance was observed to be located near turbine VAR-108. The access to the religious structure has not been restricted due to the project.		Local cultural heritage should be protected, if any.	The access to the religious structure located near VAR-108 has not been restricted by MVPPL.

S.No.	Performance Standards	Observation	Gaps	Recommendation	Status
	will allow continued access to the cultural site or will provide an alternative access route.				
8.3	<b>Chance Find:</b> MVPPL should develop provisions for managing chance finds through a chance find procedure which will be applied in the event that cultural heritage is subsequently discovered.	Excavation work of the project is completed and no chance find has been reported.		In case of chance find it should be reported to regulatory authority.	No chance find has been reported/observed till date. In case of any chance find, MVPPL will report to the statutory authorities.

Table 5: Status of Implementation of EMP at MVPPL

S.No.	Impact	Description	Status of Implemented Mitigation Measures
1.	Impact on Land use	There is a permanent change in land use because of WTG erection, transmission towers with transmission Lines and access road construction.	Part of the project area comprises of fallow and barren land. Hence, it is assessed that wind farm development will not cause adverse impact on nearby area. Although the impact is irreversible, the land foot print of the project is limited and does not allow any restriction on access to the internal access roads and area outside the fencing built around the WTG and its transformer yard.
2.	Impact on Land due to improper waste disposal	<ul style="list-style-type: none"> <li>Waste oil from the turbine gear box.</li> <li>Improper disposal and handling of waste oil can lead to soil contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Suitable storage yard for storing segregated hazardous and solid waste ensured.</li> <li>The storage space is an impervious paved surface and has a secondary containment area and spill control toolkit.</li> <li>Waste is being disposed of through approved vendors in accordance with standard norms.</li> </ul>
3.	Water Quality	There is no wastewater generation from the wind power generation process. Only sewage would be generated from substation and CMS building and this is of negligible quantity.	<ul style="list-style-type: none"> <li>Adequate septic tank along with soak pit is provided at site.</li> <li>Further awareness programs are being organized on the conservation of water to all site personnel in different forums like World Environmental Day, water day etc.</li> </ul>
4.	Ambient Air Quality	There are no emissions from the wind power generation process. However, vehicle movement produces fugitive emissions.	Vehicles with valid Pollution Under Control (PUC) certificate are being utilized for commuting.
5.	Noise Levels	Noise resulting from wind turbines	<ul style="list-style-type: none"> <li>The wind turbines are maintained in good running conditions throughout the operational life of the project through routine maintenance.</li> </ul>

			<ul style="list-style-type: none"> <li>Machine noise levels are being monitored through sensors for ensuring optimum operation of the wind turbines.</li> <li>Third party ambient noise monitoring is being carried out on annual basis.</li> </ul>
6.	Shadow Flickering	Operation of WTGs	<ul style="list-style-type: none"> <li>Management has taken care of micro siting for individual wind turbine foot print based on different parameters including shadow flickering.</li> <li>A well laid Grievance Redressal Mechanism has been established at the site, so that any issues or concerns associated with shadow flicker are reported to the site staff.</li> <li>However, till date there are no such grievances recorded.</li> </ul>
7.	Ecology	Collision of bird/bats with wind turbines and meteorological towers. Birds/ bats collision and electrocution from transmission lines.	<ul style="list-style-type: none"> <li>Long term bird and bat study has been carried out to identify the collision risk as well as bird mortality due to electrocution.</li> <li>Periodic Assessment of carcass monitoring incorporated as a part of long term bird and bat study.</li> <li>Regular inspection for any possibility of avifauna entrance is carried out.</li> </ul>

**Table 6: Status of Implementation of Community Health and Safety Management Plan during Operation Phase**

Impact	Mitigation Measures	Monitoring Plan/ Training Requirements	Responsibility	Status as on March 2019
Increase in Noise levels due to operation of wind turbines.	<ul style="list-style-type: none"> <li>Periodic monitoring of ambient noise levels</li> <li>Periodic maintenance of WTGs</li> </ul>	SOP for Noise monitoring and Maintenance checklist	Site Incharge/EHS Incharge	<ul style="list-style-type: none"> <li>Ambient noise levels are being monitored on regular basis by internal as well as external party. Third party ambient noise monitoring report is enclosed as Annexure-I.</li> <li>Periodic maintenance of WTGs is being carried out.</li> </ul>
Disturbance due to shadow flickering and blade glint caused by wind turbines	<ul style="list-style-type: none"> <li>Formal grievance redressal mechanism shall be in place for the local community so that any issues or concerns associated with shadow flicker are reported to the site staff.</li> <li>Provide curtain and blinds</li> </ul>	Grievance Redressal Mechanism	EHS Incharge/Site Incharge	<ul style="list-style-type: none"> <li>Well laid grievance redressal mechanism is in place record the community grievances. Till date no grievances have been received on shadow flickering.</li> <li>Not applicable as no settlements are existing nearby WTGs.</li> <li>Not applicable</li> </ul>

	<p>in households with open roof, and windows, doors facing WTGs.</p> <ul style="list-style-type: none"> <li>Undertake plantation to hide shadow flicker near receptors (households) identified with significant impact.</li> </ul>			
Injury due to accidental blade throw	<ul style="list-style-type: none"> <li>Ensure that lightning protection systems are properly installed and maintained.</li> <li>Carry out periodic blade inspections and repair any defects that could affect blade integrity</li> </ul>	Blade inspection report	Site Incharge	<ul style="list-style-type: none"> <li>All WTGs are provided with lightning protection.</li> <li>Periodic blade inspection is being carried out.</li> </ul>
Increase in Noise levels due to operation of wind turbines.	<ul style="list-style-type: none"> <li>Periodic monitoring of ambient noise levels</li> <li>Periodic maintenance of WTGs</li> </ul>	SOP for Noise monitoring and maintenance checklist	Site Incharge/EHS Incharge	<ul style="list-style-type: none"> <li>Ambient noise levels are being monitored on regular basis by internal as well as external party. Third party ambient noise monitoring report is enclosed as <b>Annexure XII</b>.</li> <li>Periodic maintenance of WTGs is being carried out.</li> </ul>
Impact on community due to improper transportation of waste	Training of staff on matters pertaining to hazardous materials that could be encountered on site and measures to be taken in case of a spill or road accident during waste transportation	Awareness campaign	Site Incharge/EHS Incharge	Hazardous waste disposal lies with O&M contractor. As a principal employer MVPPL ensures that proper training is given to staff for transportation of waste as per Hazardous and other Waste Management Rules, 2016.

## 15. HEALTH AND SAFETY:

29. Mytrah has its own Community Health and Safety Management Plan (CHSMP) **Annexure XIII**. The plan is guided by Mytrah's Environment Policy and Occupational Health and Safety policy. The implementation of the CHSMP is given in Table 6 above.
30. Mytrah has an On-site Emergency Plan (OEP), which is part of the Integrated Management System (**Annexure XIV**). The OEP defines clear procedures for wind farm safety and emergency preparedness plan. MVPPL follows the OEP and conducts safety training programmes/mock drills as defined in the procedures. Records for the mock drills and trainings are maintained at the sub-project site.
31. According to O&M contract Clause 5.6, Suzlon Energy Limited is responsible for all issues related to safety, health and environment requirements.

## 16. INSTITUTIONAL FRAMEWORK & GRIEVANCE REDRESSAL

32. Mytrah has adequate institutional arrangement for implementation of EMP, health & safety at the sub-project. The EHS team also oversees overall implementation of the health & safety by contractors, sub-contractors, conduct audits and inspection of all the project activities and record keeping.
33. MVPPL has a Grievance Redressal Framework (**Annexure X**). The procedures for grievance redressal are clearly well defined in the Framework with responsibility. Record of any grievance or demand received from locals is maintained at the site office.

## 17. ENVIRONMENTAL SENSITIVITY:

34. The environmental sensitivity of MVPPL has been assessed by reviewing various documents, supplemented by field visit and consultation with the developer. The sub-project was commissioned in the year 2012 and is in operation phase.
35. The environmental sensitivity assessment is given below:
  - The land procured for the sub-project is partly revenue and partly private land.
  - The sub-project sites are not located in any protected area like wildlife sanctuary / national park or in close proximity of any eco-sensitive area.
  - No forest area is getting affected due to the sub-project.

- As informed by the concessionaire, no important cultural or heritage sites are getting affected due to the sub-project.
- The impacts of the sub-project are temporary in nature.

## **18. PROJECT AGAINST THE PROHIBITED INVESTMENT ACTIVITIES LIST:**

36. The sub - project does not involve any prohibited activity as per the Prohibited Investment Activities List (PIAL) of ADB.

## **19. CATEGORIZATION OF SUB-PROJECT:**

37. The sub-project can be classified as category B based upon ADB's EA requirements as per their Safeguard Policy Statement (2009). This classification is based on the review of the available documents and site visit with respect to the environmental sensitivity due to project activities.

## **20. SITE VISIT OBSERVATIONS:**

38. A site visit was undertaken by IIFCL's Safeguard Specialists on 11<sup>th</sup> June 2019 with ADB Mission of Independent Evaluation Division. The site visit was undertaken to review the implementation of the project's environmental and social safeguards. During the site visit, following staff were mainly consulted regarding environmental safeguards related measures implemented at the project site:

- (a) Mr.Kishore Kumar S, Assistant Manager QSHE & Systems, Mytrah
- (b) Mr Naveen Kumar, Regional HSE In charge, Mytrah
- (c) Mr Usman Ali, Site In charge, MVPPL
- (d) Mr. Manjunath, Area In charge, Suzlon
- (e) Mr. Ashish Kumar, HSE In charge, Suzlon
- (f) Mr. Ramakrishna, CSR In charge, Suzlon
- (g) Mr Devendra, Quality Deptt., Suzlon

39. Based on the discussions with above mentioned officials and visit, the site observations are given below:

- The area is generally devoid of vegetation and trees.
- The area has agricultural fields in the vicinity.
- The farmers are cultivating in the area. The famers were paid compensation for the entire land taken over by the sub-project. However, the farmers were allowed to grow crops in the land belonging to Mytrah after leaving a buffer zone around the WTG and transformers.
- First aid boxes and fire fighting systems are maintained at WTGs and sub-station.

- There are EHS officer present at the site from O&M contractor. The engineers present at the site understood their commitments.
- All sewage water being generated at the sub-project premises is disposed in septic tanks/soak pits.
- It was informed by the developer during site visit that no groundwater is being utilized at site. Water requirement for various activities is being taken care by the private tankers.
- On discussions with the site staff, it was informed that Health, Safety & Environment Induction is mandatory for everyone at site.
- Site staff informed that the entire site is a Personal Protective Equipment (PPE) zone. PPE like safety helmets, goggles, safety harnesses, safety shoes, hand gloves, ear plugs etc are provided to all staff and visitors. The staff at the site was seen wearing personal protective equipment such as helmets, jackets, boots, gloves etc.
- Vehicle movement discipline is maintained at site.
- Good housekeeping and good waste disposal facilities are maintained at site.
- Fire extinguishers and first aid kits are available at all WTGs and sub-station.
- Tool box talk is done for labour as well as staff.
- Safety signages could be seen at designated locations.
- Safety induction training was done for workers as well as staff.
- Mock drills on fire safety are conducted regularly.
- Records of safety trainings, mock drills and various inspections/audits are maintained at site office.
- Vehicle movement in the premises was very limited.
- No oil spillage was observed at the site. Hazardous waste is stored in designated areas as elaborated in Table 4 & 5.
- Training and accident/incident records are maintained at site.
- Developer informed that 16 security guards are present at site, out of which 5 are static (at designate sites such as office, switchyard area etc) and 11 are continuously moving from one WTG to another for vigil.
- Currently there are no labour camps at the site.
- Emergency contact numbers have been displayed at appropriate locations.
- The sub-project has a proper grievance handling mechanism and records are maintained at site.

40. The site visit photographs are given in **Photoplate - I**.

## 21. CONCLUSIONS AND RECOMMENDATIONS:

41. It is concluded from the above analysis that the sub-project MVPPL, 63 MW wind power project in the District Anantapur of Andhra Pradesh is unlikely to pose any adverse irreversible environmental risks given the nature of the activities and absence of any legally protected areas and cultural heritage sites located within and/or in close proximity to the sub-project. However, the sub-project activities have reversible environmental impacts which have been managed.
42. The sub-project was visited by ADB staff and staff from ADB's Independent Evaluation department alongwith IIFCL safeguards staff.
43. Based upon the available documents and site visit, it is concluded that the concessionaire has undertaken adequate environmental safeguard measures. The conclusions for the sub-project are given below:
- The sub-project has been planned as per the National and State Government requirement and not in anticipation to ADB operation.
  - The sub-project has achieved Commercial Operation since the year 2012. IIFCL has funded the sub-project under Takeout finance scheme after achieving COD.
  - The project site is not located in an ecologically sensitive area.
  - The project does not involve diversion of forest land.
  - The sub-project has the required national and local level permits and approvals for project in operation phase.
  - Concessionaire has confirmed and provided status of implementation of corrective action plans suggested in the ESDD study conducted by third party during the year 2016.
  - The sub-project also has a positive GHG emission reduction due to non-emission of pollutants during operation.
  - The institutional arrangement available for the implementation of environment, health & safety at MVPPL is adequate.
  - The main impacts were on land environment, water resources and waste management. However, most of the associated impacts were limited to the extent of construction phase and were temporary in nature. The EMPs are undertaken to minimize any significant negative impact during project implementation.
  - During site visit and discussion with the project developer, the implementation of EMP was found to be adequate.

- This nature of the project site coupled with the clean nature of wind power generation ensures that the Project will not cause any significant adverse environmental impacts during construction and operation. The same is evident from the site visit.
  - After approval from the Bank the ESDDR will be uploaded for public disclosure.
44. Based on the site visit and due diligence findings, it can be deduced that the sub-project has no significant environmental safeguard issues. The sub-project, therefore, does not appear to involve any kind of reputational risk to ADB funding on environmental safeguards.

## **DUE DILIGENCE ON SOCIAL SAFEGUARDS**

## **22. OBJECTIVE OF SOCIAL SAFEGUARDS DUE DILIGENCE:**

45. The Social Safeguards due diligence for the project Mytrah Vayu (Pennar) Pvt. Ltd. (MVPPL) study is carried out to assess the social monitoring compliance status of the project as per the applicable National policies/procedures as observed during the site visit as well as the information received. The main objective of this Social Safeguard Due Diligence Report (SSDDR) is,

- To assess the likely social impacts and its minimization/mitigation majors adopted of the project with respect to land acquisition, compensation and involuntary resettlement, common properties, if any, in terms of displacement, loss of incomes, and community links;
- To ascertain, in case of any adverse impact, if appropriate mitigation measures have been taken during the project planning, designing and frameworks established for carrying out safeguard measures during the implementation stage to minimize and mitigate if any adverse impacts;

## **23. PROJECT AGAINST THE PROHIBITED INVESTMENT ACTIVITIES LIST**

46. The sub project MVPPL does not involve any prohibited activity as per the Prohibited Investment Activities List (PIAL) of ADB.

## **24. APPROACH AND METHODOLOGY:**

47. The Social safeguard due diligence study for MVPPL has been carried out after reviewing the documents made available by the Concessionaire. On site visit to the project location by Environmental and Social Safeguards Specialist, discussion with the project developer MVPPL and various permits and approvals relating to the project to understand the salient features of the project and social concerns. The following documents/Reports/Licenses/permits and notifications were referred in order to prepare the Social Safeguard Due Diligence Report:

- ESDDR dated July 2016
- Project Information Memorandum (PIM)
- Project Statutory Approvals/Permits
- Project HSE documents
- Labour License
- Grievance redressal mechanism
- Community Health and Safety Management Plan

48. The social safeguards due-diligence study was carried out for the sub-project on the basis of site visit observations and understanding project scope based on information and documents provided by Concessionaire. The site visit was undertaken by IIFCL's Safeguard Specialists on 11<sup>th</sup> June 2019

with ADB Mission of Independent Evaluation Division. A detailed discussion on the social safeguards related issues was also carried out with the project team.

## **25. SOCIAL IMPACT OF THE PROJECT**

### **25.1 Land Acquisition in the Project**

49. The total land procured for the 63 MW (30 x 2.1 MW) wind farm project is 60.7 Ha. . Out of the total land required for the project, revenue Land is 15.22 ha and Private Land is 45.48 ha. State Government has allotted 15.22 ha of revenue land to the developer for 3 WTGs, balance 27 WTGs are located on private land.
50. The subproject MVPPL is spread at six Villages namely Chabala, Uravakonda, Chinnahotur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh.
51. The land has been procured on the basis of willing to sale and willing to buy basis with direct negotiation with the farmers and the rate of land was based on negotiations with individual land owners.
52. The land procured for project is a mix of agriculture and open scrub barren land in nature. Land was purchased prior to IIFCL's involvement and not in anticipation of ADB financing and that IIFCL was not involved in the rehabilitation and resettlement activities of project, if any

### **25.2 Impact on Structure**

53. The sub-project stretch falls in Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh. During the site visit it was informed and noted , that no structure is getting affected due to the project.

### **25.3 Rehabilitation and Resettlement impact in the sub-project**

54. The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures. It was informed that the private agricultural lands used in the project have been purchased on willing seller-willing buyer basis directly from the land owners with the help of local land facilitator. The sellers do not have complaint against the compensation paid.
55. Further during the site visit it was observed that there was no rehabilitation and resettlement impact in the project.

#### **25.4 Impact on Indigenous people**

56. As informed by the project developer no indigenous people are affected. The land procured for the project doesn't involve indigenous people. Further, the project got commissioned during September 2012.

#### **25.5 Impact on Religious Properties:**

57. During the discussion it was told that all the WTG locations has been so identified that there is no religious property are affected.

### **26. PUBLIC CONSULTATION & STAKEHOLDERS MEETING:**

58. The project got commissioned during the year 2012 and already in operation. During the site visit it was told that informal public consultation and stakeholders meetings were conducted during the project planning and construction stage of project.. Prior to project set up and during the construction of project the subproject developer has invited stakeholders in the project region to explain about the proposed project activity and benefits associated with the project. Project authority has discussed with the Gram Panchayats and NoC was also obtained for setting up of the MVPPL. Informal consultations were held at the villages and Panchayat level. The stakeholders identified for the project activity were villagers, Local Gram Panchayat Sarpanchs, Employees of MVPPL. During the discussion, it was explained to them that no major social impacts is expected from the operation of the project activity and the project is planned over a total area of 60,7 Ha. of land.

### **27. GRIEVANCE MECHANISM AT THE PROJECT:**

59. During the site visit it was observed that the project authority has formed their own institutional arrangements to deal with any issues/concerns in the site. Grievance Redressal Mechanism with the help of project site official is in place which comprises of the member of Project Head, Deputy Manager (Administration) and Environmental & Health Safety Officers.
60. The Grievance Redressal Committee (GRC) was formed at the project site to ensure that any affected person's grievances are adequately addressed and to facilitate timely project implementation.
61. Further, it was informed that no Grievance has been received.

**28. EMPLOYMENT GENERATION AND INCOME RESTORATION:**

62. It has been confirmed by the project developer that employment opportunities has provided to the local people for various unskilled and semi-skilled activities like security guards and office assistants.

**29. COMMUNITY DEVELOPMENT ACTIVITIES:**

63. The concessionaire has carried out community development activities based on the demands made by the local people / nearby village as below:

- Village Development Committee (VDC) has been formed with a group of 9 to 15 members representing from Self Help Groups (SHG), Gram Panchayat, Anganwadi and other interested villagers
- In partnership with local NGOs, CSR works are being boosted
- Installed a mineral drinking water plant at Dharmapuri, Vajrakarur mandal
- To conserve rain water, rain water harvesting has been initiated and encouraged within stakeholders
- Awareness programs on Swachh gram panchayat, beat plastic pollution etc were given to school children in nearby villages (Kadamalakunta, PC Pyapili, Dharmapuri)
- Conducted eye cataract screening camp at Chabala and Dharmapuri. In total, 154 people got benefitted, out of which 39 underwent cataract operation and 50 got refractive error for glasses.
- Installed water filters at 4 Anganwadi centers at Chabala village
- Massive community plantation involving various stakeholders including school children was carried out on Environment day

**30. SITE VISIT OBSERVATION:**

64. A site visit was undertaken by IIFCL's Environmental and Social Safeguard Specialists on 11th June 2019 with ADB Mission of Independent Evaluation Division. A detailed discussion on the social safeguards related issues was also carried out with the project team.

65. During the site visit it was observed that :

- Fire extinguishers and first aid kits are available at identified locations for emergency use.
- Emergency contact numbers have been displayed at the prominent places for easy reference.
- The Operation and maintenance workers and staff at the site were seen wearing personal protective equipment such as helmets, jackets, boots, gloves etc.

- The sub-project has a proper grievance handling mechanism and records are maintained at site.
- The area is generally devoid of vegetation and trees and has agricultural fields in the vicinity.
- The farmers are cultivating in the area. The farmers were paid compensation for the entire land taken over by the sub-project. However, the farmers were allowed to grow crops in the land belonging to Mytrah after leaving a buffer zone around the WTG and transformers.
- First aid boxes and firefighting systems are maintained at office premises.
- Since the project is in operation, no labour camps are there in the project site.

### 31. CONCLUSION:

66. Based upon the available documents and site visits it appears that the subproject developer has undertaken social safeguard measures for better and on time implementation of the sub-project. The sub-project was visited by ADB staff and staff from ADB's Independent Evaluation department along with IIFCL safeguards staff. The key observations on due diligence on the social impacts are summarized as follows:

- The sub-project has been prepared by the Government of Andhra Pradesh as per the national and state government requirement and not in anticipation to ADB operation.
- The Commercial Operation Date (COD) of the project has achieved during 2012,
- IIFCL has funded the sub-project under Takeout finance scheme after achieving COD.
- The project does not involve any resettlement activities as land of the project is devoid of any commercial or residential structures.
- The land procured for the project doesn't result in involuntary resettlement in terms of physical and economical displacement of people.
- No cultural and community property was affected due to the project.
- There was no involuntary land acquisition or restriction on land use or on access to legally designated parks and protected areas.
- The project was disclosed to the project affected people by the project developer through informal public consultation and discussions with local panchayats.
- The subproject does not impact any Indigenous people get affected due to proposed project;
- Employment opportunities are being provided to the local people for various unskilled and semi-skilled activities like security guards and office assistants.
- After approval from the Bank the ESDDR will be uploaded for public disclosure.

67. Based on the site visit and due diligence findings, it can be concluded that the sub-project has no significant social safeguard issues. The sub-project, therefore, does not appear to involve any kind of reputational risk to ADB funding on social safeguards.




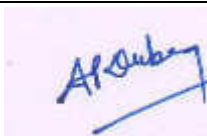

**ENVIRONMENTAL AND SOCIAL  
DUE DILIGENCE (ESDD) REPORT  
FOR  
63 MW WIND FARM AT  
VAJRAKARUR, ANANTPUR,  
ANDHRA PRADESH**

*Prepared by*

**ENVIRONMENTAL AND SOCIAL  
DUE DILIGENCE REPORT  
FOR  
63 MW WIND FARM AT VAJRAKARUR, ANANTPUR, ANDHRA  
PRADESH**

<b>Project Name:</b>	Environmental and Social Due Diligence (ESDD) Report for 63 MW Wind Power Plant at Vajrakarur, District Anantapur, Andhra Pradesh.
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## ABBREVIATIONS

AAQ	Ambient Air Quality
ADB	Asian Development Bank
APTRANSCO	Transmission Corporation of Andhra Pradesh limited
BOD	Biological Oxygen Demand
CGWA	Central Ground Water Authority
CGWB	Central Ground Water Board
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
CTE	Consent to Operate
CTO	Consent to Establish
DISH	Directorate of Industrial Safety and Health
EAC	Expert Appraisal Committee
EHS	Environment, Health and Safety
EPC	Engineering Procurement and Construction
ESDD	Environmental and Social Due Diligence
ESIA	Environmental and Social Impact assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
FGD	Focus Group Discussions
GHG	Green House Gas
GoI	Government of India
HR	Human resource
HSE	Health, Safety and Environment
IFC	International Finance Corporation
IMD	Indian Meteorological Department
IPM	Integrated pest management
IPP	Independent Power Producer
IVM	Integrated Vector Management
mbgl	Metre below ground level
MEIL	Mytrah Energy (India) Limited
MoEF & CC	Ministry of Environment, Forests & Climate Change
MSL	Mean Sea Level
MVPPL	Mytrah Vayu (Pennar) Private Limited
MW	Mega watt
NAAQS	National Ambient Air Quality Standards
NABL	National Accreditation Board for Testing and Calibration Laboratories
NOC	No Objection Certificate
O&M	Operation and Maintenance
OBC	Other Backward Caste
OHSAS	Occupational Health and Safety Management Systems
PAF	Project Affected Family
PAP	Project Affected Population

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PHC	Primary Health Centre
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PS	Performance Standard
QHSE	Quality, Health, Safety and Environment
R & R	Restoration and Rehabilitation
RTFCTLARR	Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation & Resettlement
SC	Scheduled Caste
SEIAA	State Environment Impact Assessment Authority
SEMS	Social and Environmental Management System
EHS	Environment, Health and safety
SGSL	Suzlon Global services Ltd.
SPCB	State Pollution Control Board
SOP	Standard Operating Procedure
SPS	Safeguard Policy Statement
SPV	Special Purpose Vehicle
ST	Scheduled Tribe
ST	Scheduled Tribe
TDS	Total Dissolved Solid
TSDF	Treatment, Storage & Disposal Facilities
VSPL	Voyants Solutions Pvt. Ltd.
WBG	World Bank Group
WPR	Work Participation Ratio
WTG	Wind Turbine Generator

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## 1 INTRODUCTION

### 1.1 PROJECT BACKGROUND

Mytrah Vayu (Pennar) Private Limited (hereinafter referred as MVPPL) a subsidiary company of M/s Mytrah Energy (India) Limited (MEIL) has acquired 63 MW (30 wind turbine generator x 2.1 MW) wind power project at Vajrakarur Mandal, Anantapur, Andhra Pradesh. M/s MVPPL has retained the services of M/s Voyants Solutions Pvt. Ltd. (hereinafter referred as VSPL) to undertake an Environmental and Social Due Diligence (ESDD) study in line with the requirement of IFC performance standard, Equator principles, Asian Development Bank (ADB) safe guards, World Bank Group's (WBG) Environmental, Health and Safety Guidelines covering General EHS matters and applicable national environmental and social regulatory compliance requirement.

The proposed site is spread at six Villages namely Chabala, Uravakonda, Chinnahotur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh. The nearest city Anantapur is about 45 km from the site. The nearest highway to the site is Bellary-Anantapur highway. Operation and maintenance of the project is executed through M/s Suzlon Energy limited. M/s MVPPL has signed power purchase agreement (PPA) with M/s Transmission Corporation of Andhra Pradesh limited (APTRANSCO), Government of Andhra Pradesh. The PPA specifies sale of 100% power generated to APTRANSCO on tariff determined in accordance with Andhra Pradesh State Electricity Board guideline.

### 1.2 OBJECTIVE OF THE STUDY

The Environment and Social Due Diligence study has been carried out by VSPL in consultation with MVPPL to assess the compliance of the project in line with the requirement of IFC performance standard, Equator principles, Asian Development Bank (ADB) safe guards, World Bank Group's (WBG) Environmental, Health and Safety Guidelines covering General EHS matters and applicable national environmental and social regulatory compliance requirement. The report has been prepared as per the documents received from project developer and site observations. The objective of this report stands with following but not limited to:

- Articulate the baseline condition through primary and/or secondary sources and independent assessment of the project against IFC, Equator Principle, World Bank and ADB requirements.
- Assessment of existing EHS system implemented at specific projects with action plan
- Assessment of compliances related with Environment and Safety aspects considering specific project
- Recommendation of corrective action plan against compliance gaps based on ADB's SPS requirements, IFC requirements and applicable Environmental, Health, safety and social laws of Government of India
- Specifically addressing foreseeable risks and mitigation measures in order to support the investor's investment decision and follow up approach.

### 1.3 SCOPE OF WORK

The due diligence report for project has the following scope of work:

- i. Project description including details of adopted technology for wind power generation
- ii. Baseline status of environmental and social profile of project area based on primary and secondary information and detailed site visits
- iii. To list out flora and fauna at the project and surroundings based on primary and secondary survey
- iv. Review of land documents and land acquisition process adopted for the project and impact of land acquisition
- v. Environmental and Social impact (if any) for any applicable ROW
- vi. Check and confirm if the project is properly following to the Environmental and Social good practices.
- vii. Check and confirm if the project is compiling with the applicable Environmental and Social regulatory requirements.
- viii. Assessment of EMP of proposed activity
- ix. Public consultation with villagers and stakeholders considering EHS and Social impact
- x. Review of Grievance redress mechanism policies
- xi. Assessment of community development programme details
- xii. Review of Disaster Management Plan

### 1.4 APPROACH AND METHODOLOGY

The due diligence report has been prepared based on the scope of work of the consultancy service; Environmental and Social Safeguards Framework (ESSF) of IFC and operational policy documents of the ADB. The methods followed for the preparation of due diligence report has been discussed under following sections-

#### **Activity 1: Review of documents**

During site visit available reports and relevant documents related to environment and social safeguards with the developer have been reviewed. The documents included Information, Memorandum, Detailed Project Report, HSE documents, Training Schedules etc.

#### **Activity 2: Consultations with the Developer**

Two-stage consultation process has been conducted towards preparation of the due diligence report: -

- Consultation prior to the site visit to appraise about the project, and
- Consultation after the site visit to ascertain the compliance procedures adopted or planning to be adopted by the developer for various safeguard issues observed at the site.

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**Activity 3: Site visit and on-site observations**

Visit to the project site is treated as an integral part of the preparation of due diligence report. Consultant team visited the project site on 30th May 2016 – 2nd June 2016 to collect all the relevant information related to this study. The visited team comprises of Environmental specialist, Social and R&R Specialist, Ecology and Biodiversity expert, Laboratory professional and project proponent.

**Activity 4: Public Consultation and Stakeholders meeting**

Stakeholders Consultation was carried out to obtain their opinion about the project. During consultation with village panchayat member and other people, the time and venue was scheduled as per the convenience of the stakeholders

**Activity 5: Baseline environmental monitoring**

Environmental monitoring was carried out to compare baseline conditions with regulatory standards.

**1.5 PROJECT DOCUMENTS REVIEWED**

The following documents were reviewed during the audit:

- QHSE policy of MEIL
- Road Safety guideline of Suzlon Global Services Ltd. (SGSL)
- Social and Environment Management system of MEIL
- Standard Operating Procedure for site
- Hazard Identification and Risk Assessment Manual
- Site emergency plan
- Power evacuation plan
- Details of subcontractor working at site and sample copy of their agreement
- Training records
- Possession letter for revenue land/sale deed
- Change of Land Use certificates
- Copies of different regulatory permission obtained for the projects
- Details of CSR activities conducted by MEIL for the local communities of the area
- Copy of authorisation under Hazardous Waste Management rule
- Disposal details of Hazardous wastes
- Grievance redressal mechanism

## 1.6 LIMITATIONS

The ESDD study was carried out on the basis of the available documents, discussions with the community and visual observations at the time of site visit.

## 2 PROJECT DESCRIPTION

### 2.1 SALIENT FEATURES

The various salient features of the project in respect to site and technology are presented in Table below.

**Table 2-1: Project Salient Features**

S. No.	Salient Features	Details
1.	Location of site	Chabala, Uravakonda, Chinnahotur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur Mandal in Anantapur District in the state of Andhra Pradesh
2.	Geographical Location of the Project	Latitude-14°58' N Longitude- 77°18' E
3.	Total Project Capacity	63 MW (30 WTG X 2.1 MW)
4.	Project commissioning date	September, 2012
5.	Life time	20 years
6.	Eco-Sensitive area/receptor	None
7.	Total Available Land	60.7 Hectares (Revenue Land: 15.22 ha and Private Land: 45.48 ha)
8.	Power Evacuation	Transmission Corporation of Andhra Pradesh limited (APTRANSCO), Government of Andhra Pradesh
9.	Altitude above MSL	495 m
10.	Land use of the site	Mix of agriculture and Open scrub barren land
11.	Nearest Road & Highways	Bellary-Anantapur Highway is about 3 km from site
12.	Nearest Railway Station	Guntakal railway Station (about 30 km from site)
13.	Nearest Airport	Bangalore Airport (about 200 km from site)
14.	Cultural/Pilgrimage center	Not any within 10 km from the site

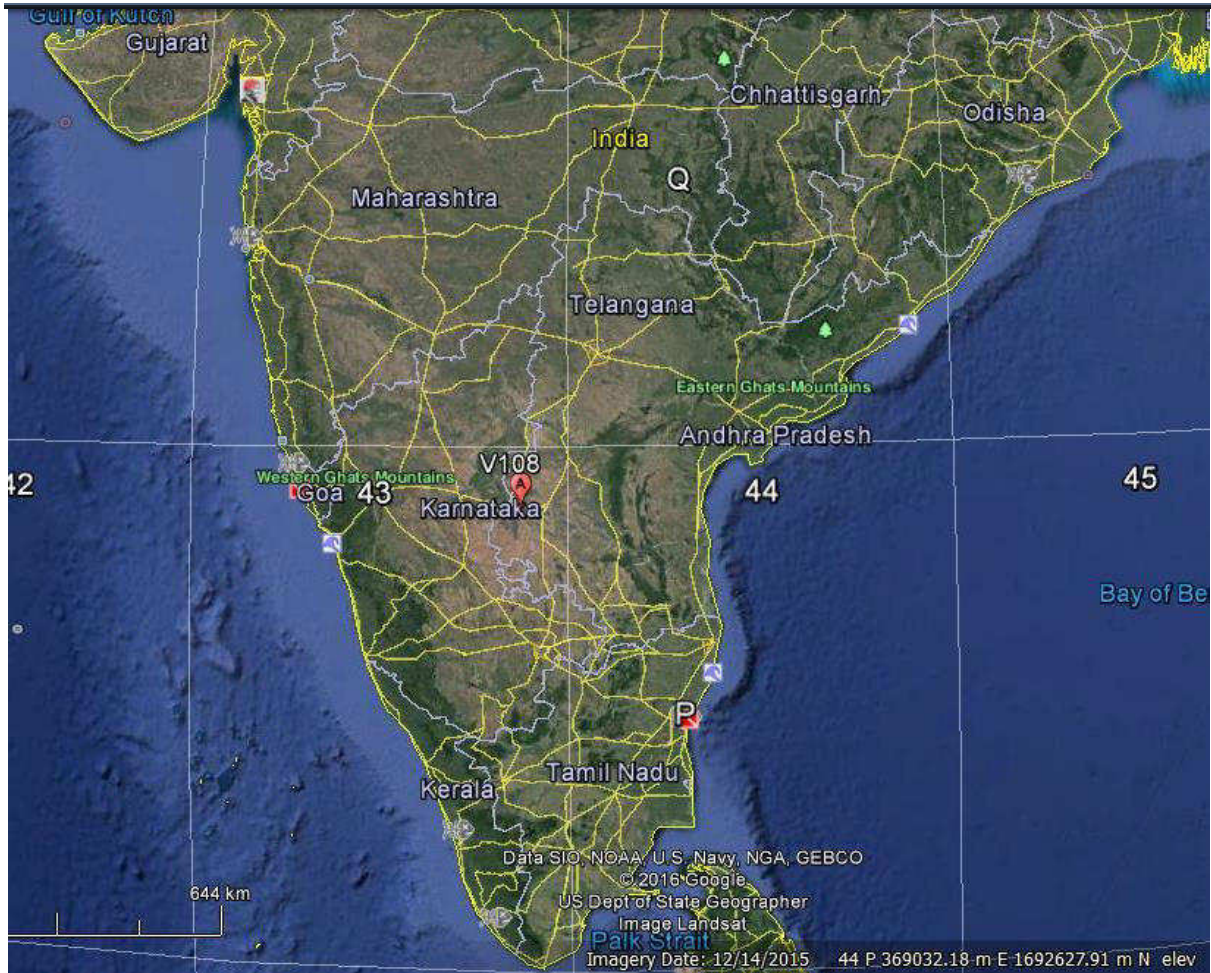
### 2.2 PROJECT LOCATION

30 WTGs are spread over six villages namely Chabla Uravakonda, Chinnahotur, P.C. Pyapili, Gadehotur and Veligonda of Vajrakarur mandal in Anantapur District. The total land required for this project is approximately 60.7 Hectares. Of the total land State Government has allotted 15.22 ha of revenue land to the developer for 3 WTGs. The location details of various WTGs are shown in table 2.2

**Table 2-2: WTG locations**

WTG No.	Extent of Land (ha)	Village
VAR 15 & 16	7.9	Chabala
VAR 18	2.9	Chabala
VAR 19	2.0	Chabala
VAR 203	2.0	Chabala
VAR 26	3.0	Chabala
VAR 23	3.9	Uravakonda
VAR 24	5.2	Uravakonda
VAR 38	2.8	P.C.Pyapili
VAR 39	2.8	P.C.Pyapili
VAR 40	2.8	P.C.Pyapili
VAR 50	3.2	Gadehothur
VAR 205	2.4	Veligonda
VAR 208	3.0	Uravakonda
VAR 209	4.7	P.C.Pyapili
		Uravakonda
		Uravakonda
		Gadehothur
		Gadehothur
		Gadehothur

Besides 15.22 ha of revenue land has been allotted by state government in Chabla Village for WTG No VK 108, VK 109, VK 110. The private lands have been purchased directly from the land owners on willing seller- willing buyer basis. The project does not involve any resettlement and rehabilitation (R & R) issue. The change of land use certificate from agriculture to non-agriculture use has been obtained from the Revenue Department, Anantapur. The Location of map the project is shown in figure 2.1.



**Figure 2-1: Location Map of the project Site**

## 2.3 TECHNICAL COMPONENTS OF PROJECT

After thorough technical evaluation 30 Nos of Suzlon's S88 with 2100 kW capacity Wind Energy Converters was selected for this project. The technical details of the WTGs are highlighted in table 2.3.

**Table 2-3 : WTG Technical Details**

Technical Aspect	Details
Rotor diameter	88 m
Installed electrical output	2100 Kw
Cut-in wind speed	4 m/s
Cut-out wind speed	25 m/s
Rated wind speed	14 m/s
Rotor swept area	6082 m <sup>2</sup>
Rotational speed	15.47 rpm
Generator	Induction generator with Slip rings, Variable rotor

Technical Aspect	Details
	resistance with SUZLON-FLEXI SLIP control System.
Rated output	2.1 MW
Operating voltage	690 V
Frequency	50 Hz
Tower	77.5 m
Certifications	C-WET type test certificate, Germanischer Lloyd "Guidelines for the certification of Wind Turbine".

## 2.4 CURRENT STATUS

At the time of the study the project was fully operational. During site visit, it was reported that about 5 engineers of MVPPL and 30 engineers of turnkey contractors are deputed at site. Besides there are employees employed at site as security personnel and other different support staff.

## 2.5 ORGANIZATIONAL STRUCTURE

The site in charge is overall responsible for Environment, Health and Safety Management System at the project site. The site engineer from MVPPL is designated with additional responsibility of supervising and coordinating Environment, Health and Safety Management System at project activities at site.

## 2.6 PROJECT CATEGORIZATION

### 2.6.1 ADB Categorization Criteria

The projects are screened on the following criteria for the project classification system of ADB and to establish ADB's safeguard requirements:

**Environment:** Proposed project is screened according to type, location and scale of the project, as well as sensitivity and magnitude of their potential environmental impacts including direct, indirect, induced and cumulative impacts.

**Involuntary Resettlement:** The involuntary resettlement impacts of an ADB funded projects considered significant if 200 or more persons are physically displaced from home or lose 10% or more of their productive or income generating assets.

The projects which involve involuntary resettlement, a resettlement plan are need to be prepared that should be commensurate with the extent and degree of the impacts.

**Indigenous People:** The impacts of an ADB funded project on indigenous people is determined by assessing the magnitude of impacts in terms of:

- Customary right of use and access to land and natural resources;
- The right of cultural and communal integrity;
- The level of vulnerability of the affected Indigenous people's community;

- Socio-economic status;
- Health, education, livelihood and social security status; and
- The recognition of indigenous people

As per these criteria projects are classified into four categories: A, B, C and F1 which are described as follows:

**Category A Projects:** Projects which are likely to have significant adverse environmental and social impacts that are irreversible, diverse, or unprecedented.

**Category B Projects:** Projects with potential adverse environmental and social impacts that are less in number, generally site-specific, mostly reversible and readily addressed through mitigation measures;

**Category C Projects:** Projects with minimal or no adverse environmental and social impacts;

**Category FI Projects:** Projects which involve investment of ADB funds to or through a financial intermediary.

## 2.6.2 IFC Categorization Criteria

As part of its review of a project's expected social and environmental impacts, IFC uses a system of social and environmental categorization. This categorization is used to reflect the size of impacts understood as a result of the client's social and environmental assessment and to specify IFC's institutional requirements. The following categories are used by the IFC:

**Category A Projects:** Projects with potential significant adverse environmental and social impacts that are diverse, irreversible or unprecedented;

**Category B Projects:** Projects with potential limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures;

**Category C Projects:** Projects with minimal or no adverse social or environmental impacts, including certain financial intermediary (FI) projects with minimal or no adverse risks;

**Category FI Projects:** All Financial Intermediary (FI) projects excluding those that are Category C projects.

IFC therefore categorizes projects primarily according to the significance and nature of impacts. IFC defines the project's area of influence as the primary project site(s) and related facilities that the client (including its contractors) develops or controls; associated facilities that are not funded as part of the project (funding may be provided separately by a client or a third party including the government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project; areas potentially impacted by cumulative impacts from further planned development of the project; and areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. The area of influence does not include potential impacts that would occur without the project or independently of the project.

The major observations of the proposed project are as follows.

- The project is a greenfield project. No resettlement and rehabilitation or involuntary resettlement is proposed for the project.
- The land for the project is devoid of any natural forest or ecology of great concern. Hence no significant impact on ecological balance of the area is expected. The project is located away (10km surrounding the project boundary) from all ecologically sensitive areas like national parks, wildlife sanctuaries, scheduled areas and critically polluted areas.
- No specific group of community is likely to be get affected by the project.
- The site is devoid of any settlement. Hence, no impact on nearby settlement is expected due to project activities.

On the basis of above observations project is categorized as 'Category B'.

### 3 BASELINE CONDITION OF PROJECT AREA

#### 3.1 TERRAIN

The terrain in and around the project site shows that it is a more or less a flat terrain. The average terrain elevation of the site is 495m, with a maximum elevation of 541m and a minimum of 465m above sea level.

#### 3.2 GEOMORPHOLOGY

Geomorphologically, Anantapur district forms the northern extension of Mysore Plateau. The district is underlain by various geological formations ranging in Age from Archaean to Recent. Major part of the district is underlain by the granites, gneisses and schists of Archaean and Dharwar Supergroup. The project site is majorly characterized by plain terrain with prevalence of black soils. The surrounding area comprises of agricultural lands and scattered villages which indicates a rural setup.

#### 3.3 CLIMATE & METEOROLOGY

Anantapur has a semi-arid climate, with hot and dry conditions for most of the year. The climatological information of the area has been obtained from the Indian Meteorological Department (IMD), Gol. Summers start in late February and peak in May with average high temperatures around the 39 °C range. The average annual rainfall of the district is 561 mm. September and October are the wettest months of the year. There is not much variation in the daily maximum temperature during different season and varies between 29.0 °C to 38.6 °C. December is the coldest month with highest daily temperature of 29.0 °C and lowest daily temperature of 17.6 °C.

#### 3.4 HYDROGEOLOGY

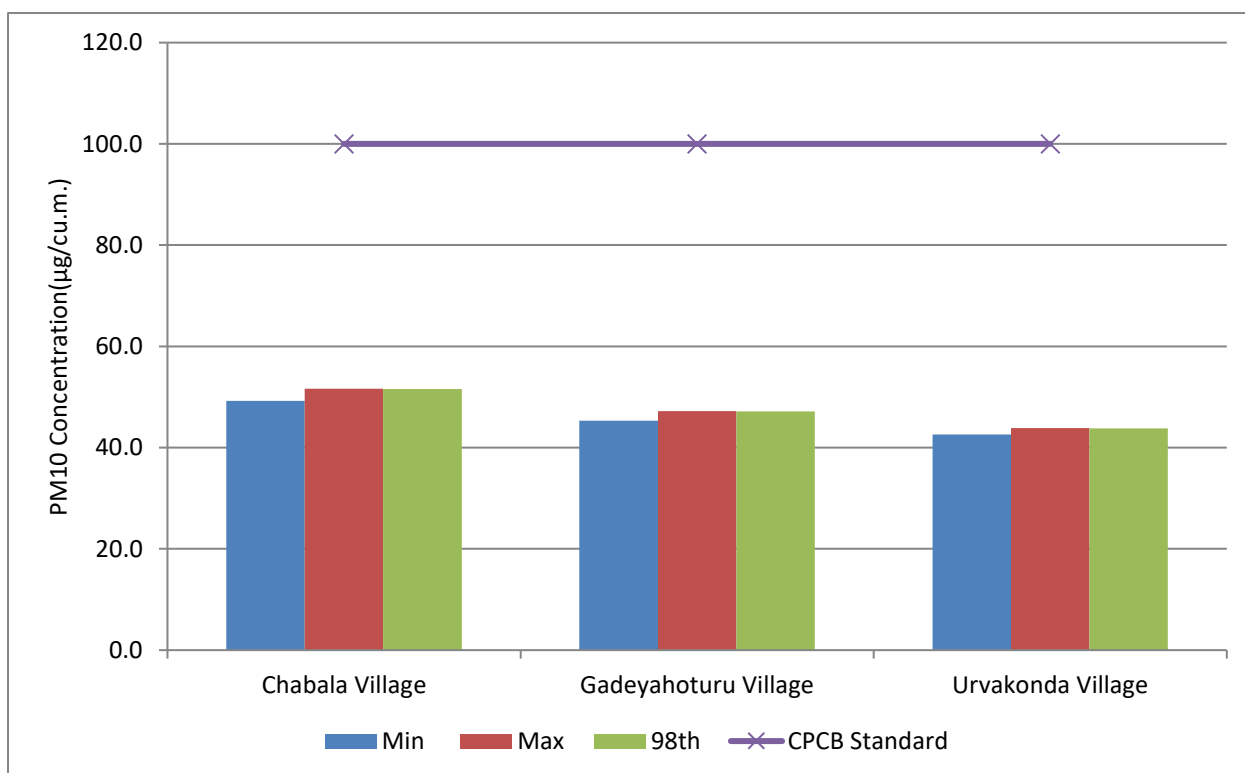
The district is underlain by granite gneisses and schists of Archaean age and formation of Cuddapah Super Group belonging to upper Precambrian to lower Paleozoic Age. River alluvium occurs along the major river courses and to some extent along minor stream courses. As per the reports of Central Ground Water Board (CGWB), Gol the net ground water availability is 53024 MCM. The depth to water level during pre-monsoon varies from 0.65-11.97mbgl. The depth to Water level ranges from 0.37 to 15.26 mbgl during the post monsoon period. The depth to water levels between 5-10 m is observed in majority of the area.

#### 3.5 AIR ENVIRONMENT

The monitoring of the ambient air quality (AAQ) in and around the project site has been carried out for one week from 24.05.2016 to 30.05.2016. Sampling at each location and analysis has been carried out as per guidelines of Central Pollution Control Board and as per the requirements of MoEFCC. All the parameters of ambient air quality are well within prescribed limit. The results of ambient air quality monitoring stations have been highlighted in Table 3.1 to 3.4 and figure 3.1 to 3.4.

**Table 3-1: PM<sub>10</sub> concentration at different monitoring site**

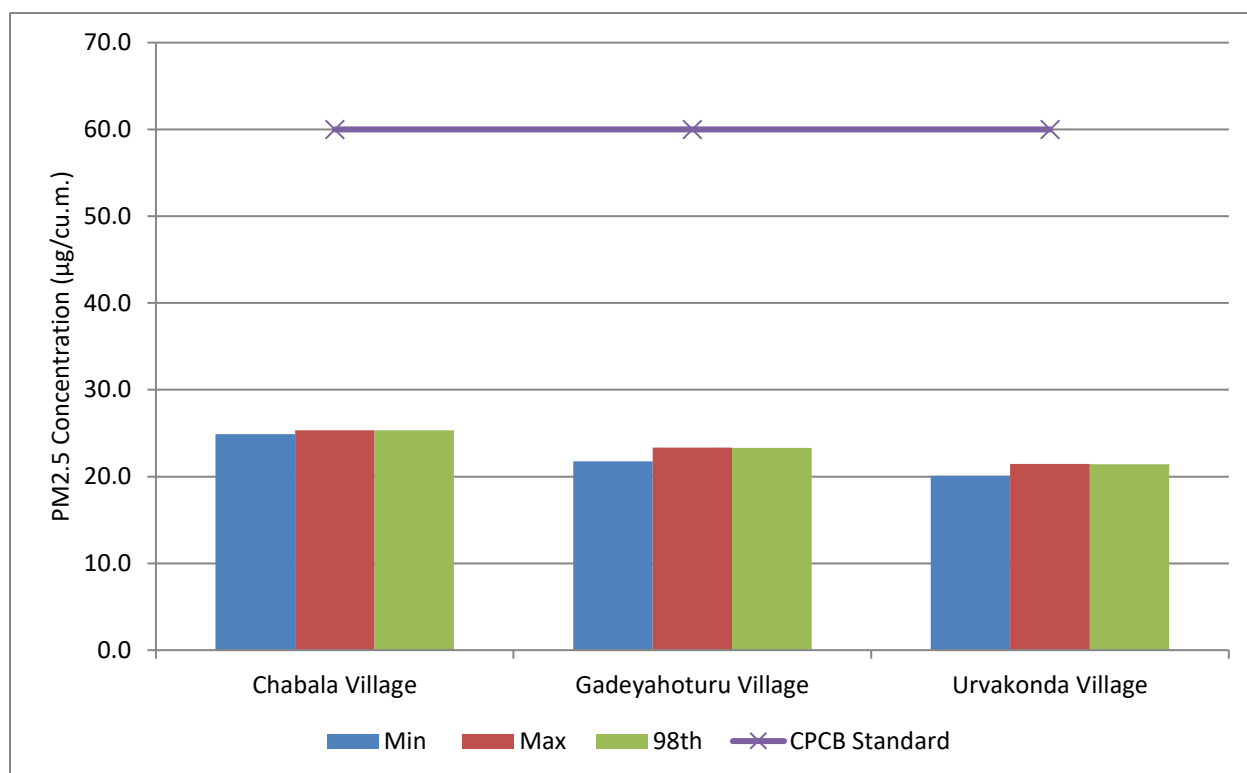
PM <sub>10</sub>	Chabala Village	Gadeyahoturu Village	Urvakonda Village
<b>Min</b>	49.2	45.3	42.6
<b>Max</b>	51.6	47.2	43.8
<b>98<sup>th</sup> percentile</b>	51.6	47.2	43.8



**Figure 3-1: PM<sub>10</sub> concentration at different monitoring site**

**Table 3-2: PM<sub>2.5</sub> concentration at different monitoring site**

PM <sub>2.5</sub>	Chabala Village	Gadeyahoturu Village	Urvakonda Village
<b>Min</b>	24.9	21.8	20.1
<b>Max</b>	25.3	23.3	21.4
<b>98<sup>th</sup> percentile</b>	25.3	23.3	21.4



**Figure 3-2: PM<sub>2.5</sub> concentration at different monitoring site**